

# EXHIBIT H

Critique of  
“FOSTER CARE CASE REVIEW OF THE  
OKLAHOMA DEPARTMENT OF HUMAN  
SERVICES”

Dated February 17, 2011,  
authored by  
Center for the Support of Families, Inc.

Expert for the Plaintiffs  
Case 4:08-cv-00074-GKF-FHM

Submitted by  
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June 15, 2011

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## Introduction

I have been retained by counsel for the OKDHS Defendants to consult and to review Plaintiffs' expert witness reports and depositions and to offer fact and expert testimony on behalf of the OKDHS Defendants. In completing this engagement I have reviewed the expert report of the Center for the Support of Families (CSF)<sup>1</sup> and the depositions of Dr. Jerry Milner<sup>2</sup> and Dr. Jacqueline Smollar<sup>3</sup>. I have reviewed other materials referenced in my report or provided in my considered materials.

I am a biostatistician and an engineer. I have worked in the field of child welfare for 13 years. I maintain child welfare outcomes statistics for the 12 states that participate in the Fostering Court Improvement project (FCI). I am a funder, a co-founder, and the statistician for the project. The FCI statistics are used to train juvenile court judges, attorneys, and other stakeholders in the interpretation and tracking of their local outcomes. I train, analyze data, and write software in the child welfare field full-time. I also founded and chair the Barton Child Law and Policy Center at the Emory University School of Law. I previously worked part-time building statistical modeling software for major drug manufacturers' new drugs. Prior to that, I worked for 15 years in medical imaging research (PET, SPECT, and MRI).

My educational and professional background, including my publications, is set forth in Appendix A to this report.

## Summary

CSF, under the direction of Dr. Milner, has reviewed 374 case files of children in Oklahoma Department of Human Services (OKDHS) custody for 60 days or more on March 1, 2010. In my opinion, the choice by Drs. Milner and Smollar to draw their sample from a slice of cases in custody on March 1, 2010 dictated that their review would present a biased view of the experiences of the class in this case. Without justification, they then compounded that biased view by limiting their population to cases in custody for 60 days or more, excluding much of the class from representation in the study population.

Dr. Milner asserts that his sample of 374 children from his study population of 6,701 children was selected randomly.<sup>4</sup> A simple check of the lengths of stay in custody between the sample (20.5 months<sup>5</sup>) and the study population (18.6 months<sup>6</sup>) tells a very different

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<sup>1</sup> "Milner report", 2/17/2011.

<sup>2</sup> "Milner deposition" volume 1 on 5/19/2011 (MilnerVoll.pdf) and volume 2 on 5/20/2011 (MilnerVollII.pdf).

<sup>3</sup> "Smollar deposition", 6/1/2011, condensed version, 11.6-1 Smollar Deposition - condensed version.pdf.

<sup>4</sup> Milner report p 13.

<sup>5</sup> Median length of stay on 3/1/2010 calculated from the 374 records of children in Milner 115678, native filename "OK Instrument Final Version[1]-FINAL with JS edits version 9.sav" last saved on 2/9/2011 at 7:45:49.

<sup>6</sup> Median length of stay on 3/1/2010 calculated from the 6,701 records of children in Milner 107240, native file name "5-1 OKDHS Custody Children 3-1-2010.xls", attachment to 5/6/2010 email from [ygrewal-kok@childrensrights.org](mailto:ygrewal-kok@childrensrights.org) to Dr. Milner.

story. In one million draws of samples structured as Dr. Milner's, 97% yield median lengths of stay shorter than Dr. Milner's sample. In my opinion, it is very unlikely that Dr. Milner's study sample is a simple random sample from the study population. It is therefore very unlikely that Dr. Milner's sample represents his study population, a population that, by design, does not represent the class in this case.

Dr. Smollar's analytical choices compound the bias still further. The federal government has developed a rich set of standardized statistics, many of which bear directly on the claims in this case. I use these statistics daily, because they were expressly developed to enable states and smaller jurisdictions to assess their own performance in a larger national context. The selection of an unusual study population, coupled to unusual analytical choices, make every statistic in Dr. Milner's report novel and nearly impossible to interpret in any standardized context. Since neither Dr. Smollar nor Dr. Milner understands the difference between incidence and prevalence<sup>7</sup>, it is difficult to imagine why they would set out to create novel statistics for this work. I will attempt to salvage a few statistics and place them into a standardized context. In my opinion, this is work that Dr. Smollar should have done for the reader.

### **A Study Population Chosen to not Represent the Class**

Dr. Milner and his reviewers reviewed only electronic and hardcopy files delivered to them by OKDHS. That should have given Dr. Milner great flexibility in selecting his population, since there would be no stakeholder interviews or visits to county file rooms. In his report, Dr. Milner never states the purpose of his review, but, in my opinion, since his is the only large-scale file review in this case, Dr. Milner should have sought to capture as much of the experience of the class as feasible. He should have designed his population specifications to be as inclusive as possible and representative of all members of the class. Instead, Dr. Milner chose to draw his sample from a population that made up about 45% of the class.<sup>8</sup> More importantly, Dr. Milner's specifications ensured that his population would have characteristics that make them very different from most of the class in this case.

Dr. Milner specified that his population would be children in the custody of OKDHS for at least 60 days on March 1, 2010. A list of 6,701 children meeting that specification was provided by OKDHS and became the population in Dr. Milner's review.<sup>9</sup> During the prior federal fiscal year, FFY2009<sup>10</sup>, OKDHS served over 15,000 children in foster care, plus other children in legal custody outside foster care.<sup>11</sup> Since the class in this case is made up of "all children who are or will be in the legal custody of OKDHS due to a report or suspicion of

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<sup>7</sup> Milner deposition volume 1 p 119. Smollar deposition, condensed, p 70.

<sup>8</sup>  $6701/15000 = 45\%$ .

<sup>9</sup> Milner 107240, native file name "5-1 OKDHS Custody Children 3-1-2010.xls", attachment to 5/6/2010 email from [ygrewal-kok@childrensrights.org](mailto:ygrewal-kok@childrensrights.org) to Dr. Milner.

<sup>10</sup> Federal fiscal years run October to September, so FFY2009 = 10/1/2008 to 9/30/2009.

<sup>11</sup> <http://cwoutcomes.acf.hhs.gov/data/downloads/pdfs/oklahoma.pdf> visited 6/14/2011.

abuse or neglect or who are or will be adjudicated deprived due to abuse or neglect”<sup>12</sup>, Dr. Milner could have chosen to draw his sample from a population making up about 100% of the class, those children served during the prior year, for example.

The single most distinctive characteristic that those other 55% of the class possess is that they were not in OKDHS custody on March 1, 2010. About 95% of them exited custody to a permanent family prior to March 1, 2010.<sup>13</sup> None of the children in Dr. Milner’s population had achieved permanency as of March 1, 2010. Most children in the class will successfully reunify with their family, and most will do that in less than 11 months.<sup>14</sup> Sadly, most children in Dr. Milner’s study population will probably not reunify with their family and will stay in foster care well beyond 11 months.<sup>15</sup>

### Sample not Representative of Population

Dr. Milner’s report assures readers that the sample of 374 children drawn from the study population were “a simple random sample where every case in the population had an equal chance of being selected for review and analysis with the exception of children in congregate care placements (residential facilities, shelters, and group homes).”<sup>16</sup> Because the validity of this review, and the \$481,350 cost, depends on the study population being representative, the sample size being adequate, and the sample being a simple random sample, this assertion must be validated.

Neither Dr. Milner nor Dr. Smollar was able to answer questions concerning details of the sampling procedures in their depositions.<sup>17</sup> Drs. Milner and Smollar provided minimal oversight during this early stage of the study.<sup>18</sup> Tables of case plan goals and placement types from the study population were “eyeballed” by Dr. Smollar<sup>19</sup> in Appendix E of the report. Comparisons of the sample to characteristics of children in OKDHS foster care in the federal Report to Congress (RTC) make up Part 1 of the report and are offered as evidence that the sample is representative.<sup>20</sup> With two simple checks of the children’s ages at entry and lengths of stay, I will demonstrate that Dr. Milner’s sample of 374 children is not representative of either the population in the FFY2009 Report to Congress or his study population of 6,701 children.

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<sup>12</sup> UNITED STATES COURT OF APPEALS TENTH CIRCUIT, Case: 09-5093, Document: 01018362826, filed 2/8/2010.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

<sup>15</sup> AFCARS extract of children in OKDHS foster care on 3/1/2010 provided by John Gelona, OKDHS on 5/6/2011.

<sup>16</sup> Milner p 13.

<sup>17</sup> Milner deposition volume 1 p 201 and Smollar deposition, condensed, p 23.

<sup>18</sup> Milner deposition volume 1 pp 181-185. Smollar deposition, condensed, p 24.

<sup>19</sup> Smollar deposition, condensed, p 239.

<sup>20</sup> Milner report p 23. Milner deposition volume 1 p 301.

### Age at Entry

The first indication that something was amiss with either the sample or the study population should have been apparent to Dr. Smollar when she produced Tables 4 and 5 on pages 23 and 24 of the report. Table 4 lacks the seventh age category that is present in Table 5, “At least 192 (16 years) but less than 216 months (18 years).” In Table 5 the three columns of data are filled in. In Table 4 the three pieces of data that would occupy that seventh row are transferred into a smaller font in two footnotes below the table. In Table 4 the sample totals to only 372 and the percentages are both shy of 100. If Tables 4 and 5 had been produced consistently, this is how Table 4 would have appeared in the report:

**Milner Report Table 4**  
**Child’s Age at Entry into OKDHS Custody**

<b>Child’s Age at Entry into OKDHS Custody (in months)</b>	<b>Number of Children in the Sample</b>	<b>Percent of Children in the Sample</b>	<b>2009 RTC Percent Regarding the Ages of Children at Entry into Foster Care*</b>
Less than 12 months	78	20.9	20.1
At least 12 (1 year) but less than 36 months (3 years)	66	17.6	17.6
At least 36 (3 years) but less than 60 months (5 years)	48	12.8	13.1
At least 60 (5 years) but less than 120 months (10 years)	110	29.4	24.1
At least 120 (10 years) but less than 156 months (13 years)	37	9.9	10.6
At least 156 (13 years) but less than 192 months (16 years)	33	8.8	9.4
<b>At least 192 (16 years) but less than 216 months (18 years)</b>	<b>2</b>	<b>0.5</b>	<b>5.1</b>
<b>Total</b>	<b>374</b>	<b>99.9</b>	<b>100</b>

\*2009 RTC Percent provides data from the Child Welfare Outcomes 2006 – 2009 Report to Congress

I emphasized the omitted row in bold to draw the reader’s attention. Produced consistent with Table 5, it is more apparent that something is amiss in the row that was omitted from Table 4. The seventh row of children 16-17 years old has only 2 children, and the percentage in the sample is an order of magnitude (meaning a power of ten) lower than in the Report to Congress (RTC). When asked at deposition why the seventh row was omitted from Table 4, Dr. Smollar answered “Probably making the table more manageable.”<sup>21</sup>

Below Table 4 on page 23, the report reads “The differences in percentages of children in specific age groups between the case review sample and the data from the RTC are quite small, indicating a representative sample with regard to age distribution at time of entry into OKDHS custody.” Asked whether the difference between 0.5% and 5.1% is quite small, Dr. Smollar answered: “Given the confidence interval that we established, yes.”<sup>22</sup> To re-

<sup>21</sup> Smollar deposition, condensed, p 132.

<sup>22</sup> Smollar deposition, condensed, p 134.

state that in statistical terms, Dr. Smollar has asserted that her sample estimate of the proportion of children who entered OKDHS foster care at age 16 to 17 during FFY2009 is 0.5%. Since she selected a confidence interval of  $\pm 5\%$ , her 95% confidence interval would extend from -4.5% to 5.5%, which would include the true proportion of 5.1%, and therefore the difference is “quite small.” Here we have yet another indicator that something is amiss – when your confidence interval contains negative percentages.

A simple way to illustrate the flaw in Dr. Smollar’s thinking is to calculate an “expected value.” If the population proportion is known to be 5.1%, then how many children would we expect to be age 16 to 17 in a simple random sample of size 374 from that population? The answer is 5.1% of 374, so we would expect 19 children age 16 to 17 in our sample of 374. Dr. Smollar’s sample had 2 children age 16 to 17. Now, we ask is the difference between 2 children and 19 children “quite small”? Is it within our  $\pm 5\%$  precision? The answer in both cases is no, as it was with the proportions 0.5% and 5.1%. The flaw in Dr. Smollar’s thinking is rooted in a lack of basic understanding of sample size calculations and confidence intervals, but also perhaps in a lack of rigor in checking her work and the work of others by noticing and investigating values that are difficult to explain.

Since Dr. Milner had a list of all 6,701 children in the study population, and that list contained the children’s dates of birth and custody dates, Dr. Smollar could have validated the ages in her sample against the ages in the study population, as she did in Appendix E for case plan goal and placement type, rather than to the FFY2009 RTC proportions. If she had done that, she would have discovered that the ages at entry in her study population were very much closer to her sample, even in the 16 to 17 age category, where the study population proportion was 0.9%. We would expect that a random sample of size 374 drawn from that population would have about 3 children age 16 to 17, quite close to Dr. Smollar’s observed value of 2.

Dr. Milner’s sample of 374 is representative of the ages in his study population, but his study population appears to be quite different from the RTC population he used for validation, at least in terms of entries from the 16 to 17 age category. One potential explanation: Dr. Milner requested a population in OKDHS custody for minimum 60 days on 3/1/2010. A child in OKDHS custody is not necessarily in OKDHS foster care. Custody and foster care are not synonymous in Oklahoma. The terms “custody” and “foster care” are used interchangeably throughout Dr. Milner’s report. Dr. Milner did not understand that there should be a distinction between foster care and custody.<sup>23</sup> Dr. Smollar does not know of any distinction between foster care and custody.<sup>24</sup>

### **Length of Stay**

Dr. Milner’s report Part 4 begins with a treatment of the time that children spend in the custody of OKDHS. At the bottom of page 59, Dr. Milner provides a comparison to a national median length of stay in foster care: “The median length of stay in OKDHS custody

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<sup>23</sup> Milner deposition volume 1 p 176.

<sup>24</sup> Smollar deposition, condensed, pp 87-88.

of the children in our sample as of June 1, 2010 was approximately 23 months, with 48.9 percent (183) of the children having been in OKDHS custody for two years or longer by June 1, 2010. This median exceeds the national median of 15.4 months for time in foster care as of September 30, 2009, as reported in the Federal report of the Adoption and Foster Care Analysis and Reporting System (AFCARS)."

Plaintiff's expert Dr. Viola Miller's judgment is that "[t]his median far exceeds the national median of 15.4 months."<sup>25</sup> There are two important details that the casual reader might miss in Dr. Milner's statement above: 1. the length of stay of the sample was taken on June 1, 2010; and 2. Dr. Milner's sample excludes children with length of stay less than 60 days. I explain these details more thoroughly using Table 1 below. The purpose of this exercise is not just to show that the median length of stay of Dr. Milner's sample is not representative of children in the class, but also to show that, if Dr. Smollar had checked the lengths of stay among her sample against the lengths of stay among her study population, she would have found that her sample is not representative of her study population.

**Table 1**  
**Comparison of Median Lengths of Stay**

	Source	Cohort	N	Cohort Reference Date	Median Length of Stay
1	Milner 115678.sav (20 discharges)	In OKDHS custody minimum 60 days on 3/1/2010	374	6/1/2010	23.5 Months
2	Milner 115678.sav	In OKDHS custody minimum 60 days on 3/1/2010	374	3/1/2010	20.5 Months
3	Milner study population	In OKDHS custody minimum 60 days on 3/1/2010	6,701	3/1/2010	18.6 Months
4	OKDHS AFCARS	In OKDHS foster care on 3/1/2010	8,393	3/1/2010	17.6 Months
5	FFY2009 RTC for OK	In OKDHS foster care on 9/30/2009	8,780	9/30/2009	17.0 Months
6	FFY2009 RTC	In US foster care on 9/30/2009	423,773	9/30/2009	15.4 Months

I will step through the rows (1 to 6) of Table 1 to explain how the differences between the cohorts lead from Dr. Milner's 23.5 months to the true median length of stay among children in OKDHS foster care on March 1, 2010: 17.6 months.<sup>26</sup>

Row 1 of Table 1 calculates the length of stay after accounting for the 20 children identified by Dr. Milner as discharged from custody between the day the population was drawn,

<sup>25</sup> Miller report, "A Review of the Oklahoma Department of Human Services' Child Welfare Practices from a Management Perspective", March 15, 2011, p 60.

<sup>26</sup> AFCARS extract of children in OKDHS foster care on 3/1/2010 provided by John Gelona, OKDHS on 5/6/2011.



3/1/2010, and the day of the calculation, 6/1/2010.<sup>27</sup> The column “Cohort Reference Date” is the reference day for which the length of stay was calculated, 6/1/2010 in Dr. Milner’s report.

Row 2 of Table 1 calculates the length of stay of the sample on the day that the sample was drawn, 3/1/2010. Since all of the 374 children in the sample were in OKDHS custody on 3/1/2010, none of the children had discharged as of 3/1/2010, so this method avoids the need to accurately track the children discharging from custody. This turns out to be important, since the choice, by Dr. Smollar, to calculate the median length of stay of the sample as of 6/1/2010 simply added 3 months to the median, because so few of the children in the sample discharged between 3/1/2010 and 6/1/2010.

Row 3 of Table 1 calculates the length of stay of the study population of 6,701 children on the day that the population was drawn, 3/1/2010.<sup>28</sup> The median length of stay is now down to 18.6 months, 4.9 months less than Dr. Smollar calculated for the sample on 6/1/2010. The median length of stay in row 2 of Table 1, 20.5, is the proper sample estimate of this study population value of 18.6 months. The difference of 1.9 months less, in the context of medians with from 372 to 6,701 subjects, is very large.

Row 4 of Table 1 is the median length of stay of the 8,393 children in OKDHS foster care on 3/1/2010, 17.6 months. This is a full month less than the median length of stay of Dr. Milner’s study population at 18.6 months. I attribute this to Dr. Milner’s exclusion of children with stays in custody of less than 60 days. Excluding children with stays in foster care less than 60 days from the OKDHS foster care population on 3/1/2010, increases the median length of stay from 17.6 months to 19.2 months, 1.6 months longer.

Finally, this brings me to rows 5 and 6 of Table 1. These two statistics, 17.0 months median in Oklahoma<sup>29</sup> and 15.4 months median length of stay nationally<sup>30</sup>, both come from reports cited in Dr. Milner’s report. However, only the 15.4 national median was included in Dr. Milner’s report, so I am providing the directly comparable Oklahoma number from the federal report cited on page 23 of Dr. Milner’s report that was not included for comparison on page 59 in Dr. Milner’s report.

### **An Irreconcilable Difference between the Study Population and the Sample**

But the difference between the sample median of 20.5 and the study median of 18.6, rows 3 and 4 in Table 1, is still unexplained. Statistical tests would find this difference statistically significant, but for my audiences I usually prefer a method that requires fewer

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<sup>27</sup> Median length of stay on 6/1/2010 calculated from the 374 records of children in Milner 115678, native filename “OK Instrument Final Version[1]-FINAL with JS edits version 9.sav” last saved on 2/9/2011 at 7:45:49.

<sup>28</sup> Median length of stay on 3/1/2010 calculated from the 6,701 records of children in Milner 107240, native file name “5-1 OKDHS Custody Children 3-1-2010.xls”, attachment to 5/6/2010 email from [ygrewal-kok@childrensrights.org](mailto:ygrewal-kok@childrensrights.org) to Dr. Milner.

<sup>29</sup> <http://cwoutcomes.acf.hhs.gov/data/downloads/pdfs/oklahoma.pdf> visited 6/14/2011.

<sup>30</sup> [http://www.acf.hhs.gov/programs/cb/stats\\_research/afcars/tar/report17.htm](http://www.acf.hhs.gov/programs/cb/stats_research/afcars/tar/report17.htm) visited 6/14/2011.

assumptions, provides richer information, and is more easily understood. A computer simulation of 1 million sample draws from the study population is the basis for my claim above that the difference of 1.9 months is “very large.” Statistical simulation was my primary tool for 8 years in assessing the efficacy, side effects, and cost effectiveness of new drugs. I explain my method here.

The concept behind statistical simulations draws from “frequentist” statistics or “frequentist inference”, the mainstream of statistics. Wikipedia describes frequentist inference as “... the inference framework in which the well-established methodologies of statistical hypothesis testing and confidence intervals are based.”<sup>31</sup> Frequentist statistics, such as confidence intervals, are rooted in repeated experiments, so I repeated an experiment.

I can draw a simple random sample of size 374 from the study population of 6,701 children, just as CSF did for this review.<sup>32 33</sup> In fact, I can repeatedly draw samples of 374 from the study population of 6,701 using a different set of 374 randomly generated numbers each time. If I calculate the median length of stay each time I take a new sample, I will find a slightly different median length of stay from each sample. If I repeat my sample draw 100 times, then I will have 100 sample median lengths of stay. If I repeat my sample draw 1 million times, then I will have 1 million sample median lengths of stay. The frequencies of occurrence of each value are shown as a bar graph in Figure 1 (this is known as a histogram, also referred to as an empirical distribution function).

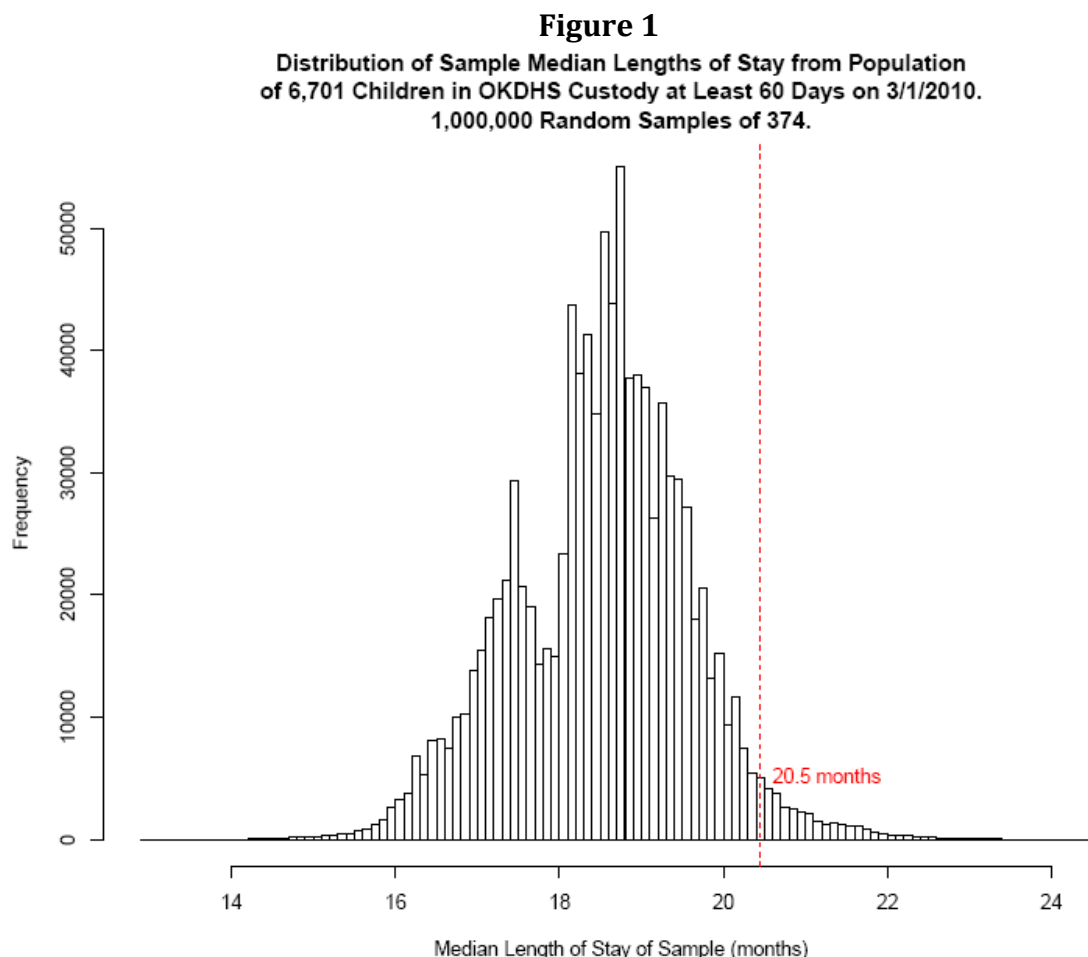
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<sup>31</sup> <http://en.wikipedia.org/wiki/Frequentist> visited 6/14/2011.

<sup>32</sup> R (<http://www.r-project.org/>) statistical language code for this simulation, 2 minutes runtime:

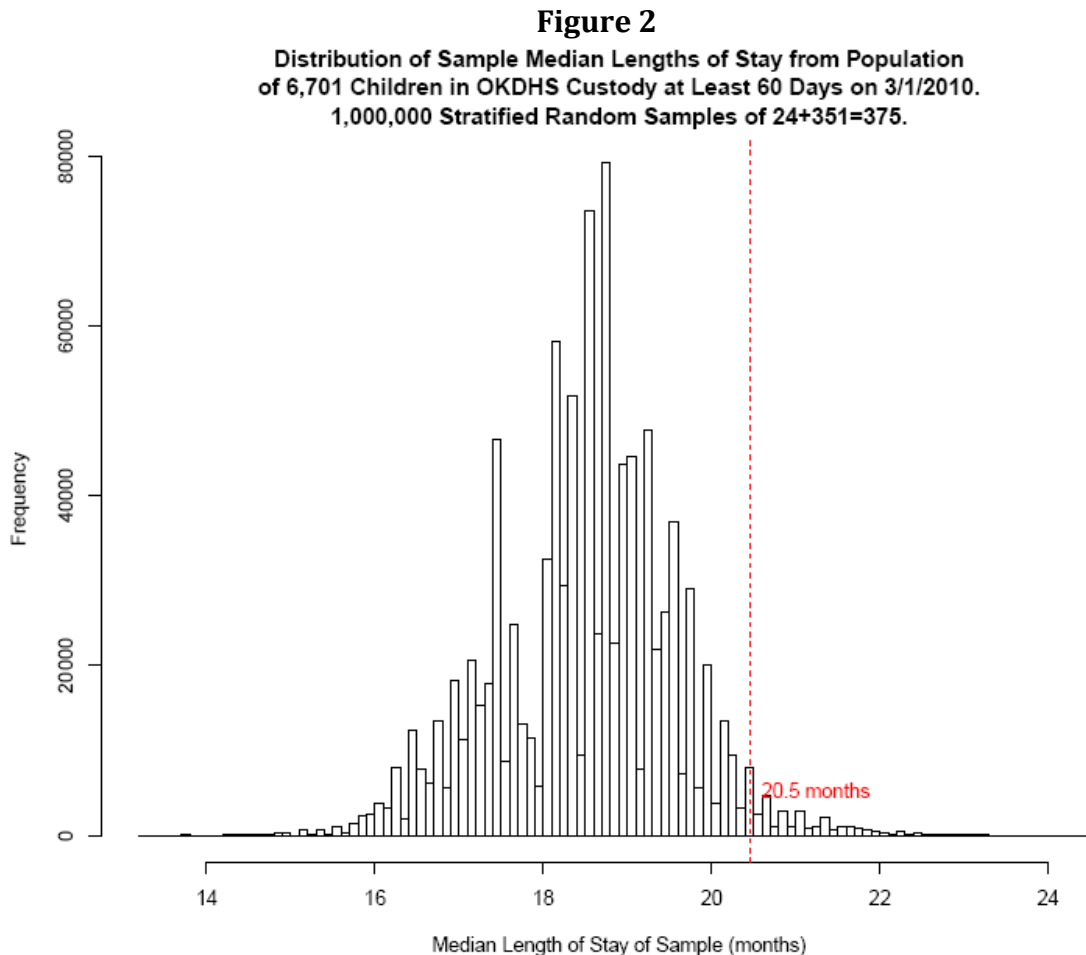
```
# mi0 is the data frame with the 6,701 records
los <- as.numeric( as.Date('2010-03-01') - mi0$begdt )/(365.25/12)
set.seed( 1 ) ; RNGkind( 'default' )
f1 <- function(i, n) { median( sample(los, n) ) }
mi0.374 <- sapply( 1:1000000, f1, 374 )
```

<sup>33</sup> R's default pseudorandom number generator is “Mersenne-Twister”:  
Matsumoto, M. and Nishimura, T. (1998) Mersenne Twister: A 623-dimensionally equidistributed uniform pseudo-random number generator, ACM Transactions on Modeling and Computer Simulation, 8, 3-30.



Of the 1 million random samples, 97% had shorter median lengths of stay than Dr. Milner's single sample. To put it another way, if Dr. Milner were to draw another simple random sample of 374 from his study population, 97 times out of 100 that sample would have a shorter median length of stay than the sample Dr. Milner used in this study. Showing this graphically, the median length of stay of Dr. Milner's sample as of 3/1/2010 is 20.5 months, displayed as the red dashed line in Figure 1. In my opinion, based on this simulation, it is very unlikely that Dr. Milner's sample was actually a simple random sample with equal probabilities of each unit being drawn for the sample. All inferences in Dr. Milner's report, including the assertion that his sample is representative of the study population, depend upon his sample being a simple random sample (SRS). In my opinion, that is very unlikely.

The above result comes from a set of simple random samples from Dr. Milner's study population. However, Dr. Milner's sample, as described in the text of his report, was actually made up of two alleged simple random samples: one SRS of size 24 from children in congregate care and a second SRS of size 351 from children in non-congregate care. Theoretically, Dr. Milner's sampling scheme should be similar to a single SRS. I tested this theory, by performing my simulation another 1 million times using the sampling scheme described in Dr. Milner's report. The frequency results are shown in Figure 2.



The result here is the same: 97% of the 1 million samples had shorter median lengths of stay than Dr. Milner's single sample. But the distribution of the sample median lengths of stay looks different. It is now much choppier, with a larger dip at 18 months.

The choppiness is caused by the split into two arms: the congregate and non-congregate care arms. The maximum frequency of a median length of stay will be different in each arm. Because there are so many fewer children in the congregate care arm, the frequency bars are lower for certain lengths of stay.

The dip in the distribution at 18 months is probably due to the timing of court review hearings, which are required every 6 months in some states. The periodic 6-month hearings tend to make discharges just before the hearing less likely and discharges at or just after the hearing more likely. This is speculation on my part, but based on experience with other child welfare timeliness distributions showing similar effects.

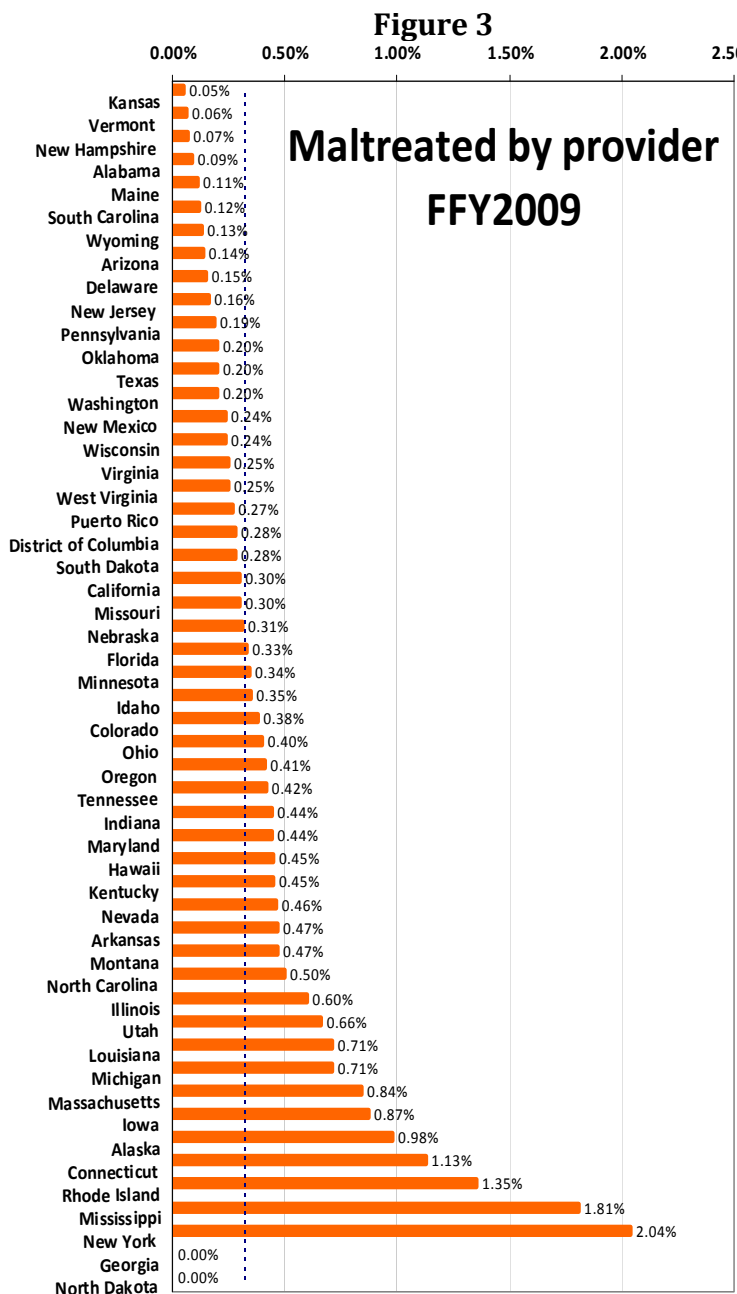
The complex shape of this distribution is an excellent illustration of the pitfalls of assumptions like normality in statistical approximations, and the increased complexity of analysis that design choices like sampling in more than one study arm mandate. It also illustrates the rich information and the reality check that a simple simulation can provide.

### Malreatment in OKDHS Custody

Dr. Milner recognized that children who spend longer in care are exposed to greater risk of maltreatment. When asked “Do you believe that children that are in care a longer period of time are more at risk of maltreatment in care?”, Dr. Milner responded: “I believe that if the agency is not carrying out its responsibilities to protect the children, and they have responsibility for protecting them over an extended period of time, they are exposing that child to even greater risk of being maltreated.”<sup>34</sup>

As evidenced by Figure 3, our state child welfare systems have varying records of carrying out the responsibility to protect children in their care.<sup>35</sup> Being less than perfect, in all of our states some children experience maltreatment in foster care.

The measure of safety (or lack thereof) that was developed for the federal Child and Family Services Review (CFSR) is shown for all 50 states and 2 territories in Figure 3. Kansas tops the list with a rate of 0.05% maltreated per year, and New York is at the bottom with a rate of 2.04% per year. The federal website is not current with Oklahoma’s corrected safety data. The corrected Oklahoma FFY2009 performance on this measure is 0.57%, moving it down to



<sup>34</sup> Milner deposition volume 1 p 124.

<sup>35</sup> CFSR measure S1.2, “Of all children served in foster care in the year shown, what percent were not victims of a substantiated or indicated maltreatment by a foster parent or facility staff member?” Data taken from <http://cwoutcomes.acf.hhs.gov/> visited 6/14/2011. Georgia and North Dakota were unable to report, they did not have zero children maltreated.

just above Illinois in the Figure 3 ranking.<sup>36</sup>

Even with the best of intentions government protection of child maltreatment victims through foster care exposes them to a non-zero risk of additional maltreatment each day they are in state custody. Biostatisticians, like myself, who do a lot of work in the field of “survival analysis” (I worked in cancer research, where the term originated) generally talk in terms of exposures to risk over time, because often the risk is intertwined with time.<sup>37</sup> Those non-zero risks accumulate over time. In some states the risk accumulated by the children served in foster care over the course of a year is greater than in other states, as evidenced in Figure 3.

The federal government, and all of the many stakeholders who contributed to the design of the CFSR measures through expert panels and the request for comment process, made a design choice to measure the risk of maltreatment in foster care over a 12-month period. Drs. Milner and Smollar have abandoned that work, aggregating incidents of maltreatment over several years, rather than limiting the exposure time to 12 months as is the agreed-upon federal practice. The choice to limit to a consistent exposure time was not, as Dr. Smollar contends, simply a convenience “Because the National Child Abuse and Neglect Data System [(NCANDS)] cannot follow children over two reporting periods.”<sup>38</sup> I receive annual NCANDS submissions from 12 states. NCANDS was designed with a child identifier that is consistent across submissions to enable the following of children over many reporting periods. I have 10 years of excellent longitudinal NCANDS data (along with the NCANDS dataset documentation) that prove Dr. Smollar incorrect. In my opinion, Dr. Smollar’s asserted rationale does not justify the abandonment of the usual and accepted practice of accounting for exposure time by limiting the incidents to a 12-month period.

### **Incidence vs. Prevalence**

On page 5 of his report, and then again on page 33, Dr. Milner refers to the “incidence of child maltreatment”. Nowhere in his report does Dr. Milner use the word prevalence. When asked at deposition if he knew whether there was a difference between incidence rates and prevalence rates, Dr. Milner answered “I do not know.”<sup>39</sup> When asked at deposition if she knew whether there was a difference between incidence versus prevalence, Dr. Smollar answered “For this particular study I would not necessarily make that distinction. They would be the same.”<sup>40</sup> When offered dictionary definitions of incidence and prevalence, Dr. Smollar chose prevalence: “Prevalence, certainly we did prevalence.” Dr. Smollar is correct. A cross-sectional study, such as Dr. Milner’s, can only measure prevalence, not incidence.

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<sup>36</sup> 03/15/2011 communication from Attorney Bob Nance that OK’s corrected FFY2009 CSFR measure of maltreatment in foster care is 0.57%.

<sup>37</sup> Hosmer DW, Lemeshow S. Applied Survival Analysis. New York: Wiley 1999.

<sup>38</sup> Smollar deposition, condensed, p 79.

<sup>39</sup> Milner deposition volume 1 p 119.

<sup>40</sup> Smollar deposition, condensed, p 70.

The incidence rate is the number of new cases per population in a given time period, in child welfare typically measured in annual increments. In contrast, prevalence is a measure of the total number of cases of disease or, in the present context, maltreatment, in a population.

To put the difference between incidence and prevalence into clearer focus, I offer the example of asthma. Chronic diseases, like asthma, have low incidence, but high prevalence (because they are chronic), so they are commonly measured in terms of their prevalence in the population, or in a cross-section of the population, such as all children in the United States on July 1 of each year. This is why cross-sectional studies and prevalence go hand-in-hand in the field of public health. Asthma is, perhaps, the most prevalent chronic childhood disease.<sup>41</sup> The prevalence rate of asthma is currently about 10%. The incidence rate of asthma is currently about 0.20%.<sup>42</sup> Incidence rates that small are extremely difficult to measure, yet, because it is a chronic disease, the prevalence of asthma is relatively easy to measure. Like child maltreatment, victims of asthma suffer with its effects for a lifetime, so the prevalence of the disease in the population builds over lifetimes from a low incidence rate.

Coincidentally, our national rate of maltreatment in foster care as measured by the CFSR, 0.48%, is on the same order of magnitude as the incidence of asthma.<sup>43</sup> That rate of maltreatment in foster care is often referred to as the incidence of maltreatment in foster care (thus Dr. Milner's and Dr. Smollar's confusion, or perhaps desire to label their rate the same). Treating that 0.48% rate as an estimate of the incidence rate of maltreatment in foster care, and viewing child maltreatment as a chronic disease (once a child is maltreated, that child is forever a victim of maltreatment, as in Dr. Milner's study), if we were to measure national prevalence rates of maltreatment in foster care, it would not be surprising to find that they are in the range of double the prevalence rate of asthma, 20-25%. To my knowledge no one has done this. Dr. Smollar was also unable to provide any references for her novel measurement of the prevalence of child maltreatment.<sup>44</sup>

### **"Shockingly High Rates of Maltreatment"**

In an attempt to put this novel measure into some larger context, I have calculated some rates of maltreatment in care for a few states in Table 2 below:

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<sup>41</sup> There is some debate, with other candidate diseases such as gum disease claiming the crown.

<sup>42</sup> <http://answers.google.com/answers/threadview/id/740204.html> visited 5/31/2011.

<sup>43</sup> Calculation of national rate based on data from <http://cwoutcomes.acf.hhs.gov/> visited 6/14/2011.

<sup>44</sup> Smollar deposition, condensed, p 164.



Table 2

Source	Cohort	N Maltreated (all perps)	Exposure (child-years)	Estimated Rate per Child-Year
FCI GA <sup>45</sup>	FFY2010	270	7,441	0.036
FCI TN <sup>46</sup>	FFY2008	257	6,869	0.037
FCI FL <sup>47</sup>	FFY2010	852	18,627	0.046
Milner Sample	In OKDHS custody minimum 60 days on 3/1/2010	45	899	0.050

The state data come from public reports on the Fostering Court Improvement website. These 3 states (Georgia, Tennessee, and Florida) were recently updated, so I used their most recent data. I do not have these data for Oklahoma. The fourth row shows comparative data from Dr. Milner's study.<sup>48</sup> The column labeled "N Maltreated (all perps)" contains the number of substantiated or indicated victims (federal definition) of maltreatment during the child's stay in foster care during the period under review (the Cohort column) without regard to perpetrator relationship ("all perps"). The column "Exposure (child-years)" is the total number of years spent by all children in foster care during the period under review. Measuring exposure in terms of "person-time", similar to my miles driven during a year, is very common in public health analysis. The 374 children in Dr. Milner's sample have spent an accumulated 899 years in OK DHS custody during their most recent episode. The exposure in child-years can be viewed as an equalizer, capturing the experiences of all of the children in these states who spent 12 days in foster care along with those who spent 12 months in foster care during the year.

I did not include Dr. Milner's counts of children who were the subject of findings of "unsubstantiated, services recommended." These cases are reported to the federal government by the state as unsubstantiated. These cases would not meet the federal definition of "victim", so they do not belong in any measure of maltreatment in foster care.

Dividing column 3 in Table 2 by column 4, I arrive at my estimates of the rates of maltreatment per child-year in foster care. In my opinion, valid comparisons can be made based on these rates. In my opinion, the 12% prevalence rate for maltreatment in foster care calculated by Drs. Milner and Smollar that the news media and Dr. Viola Miller found "shockingly high", "incredibly high", and "alarming"<sup>49</sup>, cannot be used for any valid comparisons, without adjustments for the wide range of exposure times.

<sup>45</sup> [http://fosteringcourtimprovement.org/ga/DHRRegion/incare\\_summary.html](http://fosteringcourtimprovement.org/ga/DHRRegion/incare_summary.html) visited 6/14/2011.

<sup>46</sup> [http://fosteringcourtimprovement.org/tn/DCSRegion/incare\\_summary.html](http://fosteringcourtimprovement.org/tn/DCSRegion/incare_summary.html) visited 6/14/2011.

<sup>47</sup> [http://fosteringcourtimprovement.org/fl/DCFDistrict/incare\\_summary.html](http://fosteringcourtimprovement.org/fl/DCFDistrict/incare_summary.html) visited 6/14/2011.

<sup>48</sup> Child-years in foster care calculated from the 374 records of children in Milner 115678, native filename "OK Instrument Final Version[1]-FINAL with JS edits version 9.sav" last saved on 2/9/2011 at 7:45:49.

<sup>49</sup> Miller report, "A Review of the Oklahoma Department of Human Services' Child Welfare Practices from a Management Perspective", March 15, 2011, p 3 and p 51.



Based on my estimate of 0.050 victims per child-year, I find that the rate of maltreatment in custody among the children in Dr. Milner's sample is higher than all three of these states. The rates in Table 2 are adjusted only for the exposure time, not for the many other risk factors that may be over-represented in Dr. Milner's sample relative to the children in foster care in these three states. Because I find that Dr. Milner's sample is not representative of his study population, and Dr. Milner's study population is not representative of the class in this case, I find no basis to conclude that the rate of maltreatment in foster care among the class in this case is higher than in other states.

### Conclusion

In my opinion, the choice by Drs. Milner and Smollar to draw their sample from a slice of cases in custody at least 60 days on March 1, 2010 dictated that their review would present a biased view of the experiences of the class in this case. Most children in the class will reunify with their family in a timely manner, whereas most of the children in Dr. Milner's study population will probably not reunify with their family and will experience long stays in foster care.<sup>50</sup> In my opinion, Dr. Milner unnecessarily excluded most of the class from representation in his study, and he did it in an especially biased manner.

Based on a simulated one million samples structured as Dr. Milner's, 97% yield median lengths of stay in custody shorter than Dr. Milner's sample. In my opinion, it is therefore very unlikely that Dr. Milner's study sample is a simple random sample from the study population. It is therefore very unlikely that Dr. Milner's sample represents his study population, a population that, by design, does not represent the class in this case.

The selection of an unusual study population, coupled to unusual analytical choices, make every statistic in Dr. Milner's report novel and nearly impossible to interpret in any standardized context. I have attempted to salvage and put into a comparative context one of those statistics: the rate of maltreatment in OKDHS custody. In my opinion, the rate of maltreatment in custody among Dr. Milner's sample is higher than in three comparison states. However, that comparison, without adjustment for the many other risk factors that may be over-represented in Dr. Milner's sample, is still not a basis for any conclusions. In any case, our focus should remain on the incidence rate of maltreatment among all children in OKDHS custody, not the more sensational 12% prevalence rate among Dr. Milner's non-representative sample.

I reserve the right to use as an exhibit at trial my report and any item in my considered materials. The facts or data I considered in my review and forming my opinions herein are being separately transmitted as my "considered materials." Publications I have authored in the last ten years are listed on my resume in Appendix A. During the previous four years I have not testified as an expert at trial or by deposition. As compensation for the work I

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<sup>50</sup> AFCARS extract of children in OKDHS foster care on 3/1/2010 provided by John Gelona, OKDHS on 5/6/2011.

have performed in this case, I will charge \$180 per hour. As of June 15, 2011 I have not yet invoiced or been paid. I have expended 216 hours for a total of \$38,880 compensation.

A handwritten signature in dark ink, appearing to read "Andrew B. Barclay", written over a horizontal line.

Andrew B. Barclay  
June 15, 2011

## Appendix A

### Resume of Andrew Barclay, MSEE, MSME as of June, 2011

[Andy@FosteringCourtImprovement.org](mailto:Andy@FosteringCourtImprovement.org)

512 Saint Charles Ave NE, Atlanta, GA 30308

404-875-6820

I am a biostatistician and an engineer. I have worked in the field of child welfare for 13 years. I maintain child welfare outcomes statistics for the 12 states that participate in the Fostering Court Improvement project (FCI). I am a funder, a co-founder, and the statistician for the project. The FCI statistics are used to train juvenile court judges, attorneys, and other stakeholders in the interpretation and tracking of their local outcomes. I train, analyze data, and write software in the child welfare field full-time. I also founded and chair the Barton Child Law and Policy Center at the Emory University School of Law. I previously worked part-time building statistical modeling software for major drug manufacturers' new drugs. Prior to that, I worked for 15 years in medical imaging research (PET, SPECT, and MRI).

### Education / Training

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**Emory University Rollins School of Public Health, Atlanta, GA**

Biostatistics, All But Dissertation, 1998-

**Georgia Institute of Technology, Atlanta, GA**

Electrical Engineering, Master of Science, 1992

**Stanford University, Palo Alto, CA**

Mechanical Engineering, Master of Science, 1985

**Tulane University, New Orleans, LA**

Mechanical Engineering, Bachelor of Science, 1982

### Employment and Professional Experience

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#### Child Welfare Data Consulting

Recent Projects:

- Expert Witness for Riggs, Abney, Neal, Turpen, Orbison, & Lewis P.C. representing the Oklahoma Department of Human Services in D.G. v. Henry federal class action lawsuit, Tulsa, OK. 8/2010 to present

- Data Consultant and Software Developer for the Independent Verification Agent under contract to the University of North Carolina in the L.J. v. Massinga federal class action lawsuit, Baltimore, MD. 1/2010 to present
- Visiting Statistician in the Permanency Innovations Initiative, University of Illinois Jane Addams College of Social Work, under contract from the Illinois Department of Children and Family Services, Chicago, IL. 5/2011 to present
- Data Consultant and Software Developer for Casey Family Programs, Seattle, WA. 4/2011 to present
- Training and Data Consultation on the federal Child and Family Services Review for Children's Rights, Inc., New York, NY. 4/2011
- Reviewer, *Preliminary Protective Hearing (PPH) Benchcard Study* for the National Council of Juvenile and Family Court Judges, Reno, NV. 1/2011

#### Ongoing and Past Projects:

- Statistician (unpaid) to the Fostering Court Improvement project. Develop, field-test, and train juvenile court judges, attorneys, and other stakeholders in 12 states on the use of over 150 child welfare outcome statistics. 8/2005 to present
- Consultant (unpaid) to the Georgia Supreme Court Committee on Justice for Children. 1998 to present
- Consultant (unpaid) to Georgia's state Office of the Child Advocate. 11/2000 to 10/2010
- Academic Consultant and Software Developer, University of Illinois Jane Addams College of Social Work, Urbana, IL. 2/2007 to 7/2009
- Technical Lead (unpaid), Data Analysis Team, Georgia's Child and Family Services Review. 11/2000 to 8/2004

#### Prior Work Experience

##### Consulting:

- Statistical Software Consultant, building markov and monte-carlo simulators from clinical trials data to demonstrate side-effects and cost-effectiveness of new drugs to government and managed care regulators for Pfizer, Wyeth, Forrest, Amgen, Astellas, Genentech and others. Policy Analysis, Inc., Boston, MA. 3/2002 to 12/2009
- Web-based MCMC Influenza Simulator for Thomson's Physicians World. 11/2002 to 9/2003
- Software Architecture Consulting on Java and Web Technologies to GE, Siemens, Hitachi, Adac and other medical imaging manufacturers. 1996 to 1997

#### Employment:

- ORISE Fellowship with the Centers for Disease Control and Prevention's National Center for Environmental Health. 2002 to 2004
  - Development of spatial-statistical software tools for field epidemiologists
- Research Scientist with the Cardiothoracic Research Lab, Emory University School of Medicine, Atlanta, GA. 1992 to 1996
  - PET/SPECT/MRI, Medical Imaging and Digital Signal Processing Research, High Performance Computing, Telemedicine, Software Engineer, Software Architect
- Research & Development Engineer with Digital Design, Inc., Paris, France. 1989 to 1992
  - SPECT, Medical Imaging, Satellite Imaging, Digital Signal Processing, Software Engineer
- Research Engineer, Positron Emission Tomography, Sloan-Kettering Cancer Research Institute, New York, NY. 1986 to 1988
  - PET Technologist, Medical Imaging, Software Engineer
- Research Assistant, Department of Mechanical Engineering, Tulane University, New Orleans, LA. 1982 to 1984
  - Design, Project Management, Robotics, Software Engineer

#### Honors

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- \$1 Million Java Cup International Programming Competition, 1<sup>st</sup> Place, Individual, Unlimited, "Volume Slicer Applet". 1996
- Emory University Humanitarian Award. 2004
- Thirteen other public service awards for volunteer work. 1996 to present
- Advisory Board Chair, Barton Child Law and Policy Center at Emory University School of Law. 2000 to present
- Board Member, Georgia Governor's Office for Children and Families, appointed by Georgia's Governor. 2004 to present
- Board Member, Georgia Technology Authority, appointed by Georgia's Chief Justice. 2001 to 2005
- Full Tuition Scholarship and Stipend, Emory University Rollins School of Public Health Department of Biostatistics. 1997 to 2001
- Lincoln Foundation Design Competition, Bronze Medal, "Heavy Truck Air Suspension Design". 1985

#### Publications

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#### Child Welfare:

- C Church, A Barclay, "Getting to Ground Truth: The Child Welfare Doppler Radar," University of Minnesota Center for Advanced Studies in Child Welfare, CW360, p 34, Spring 2011.
- Locker, Beth, and Andrew Barclay. "Measuring the next 30 years." University of Michigan Journal of Law Reform 41.1 (2007): 269-280.

#### Selected Child Welfare Conference Presentations:

- Andy Barclay, *Georgia's CFSR Experience*, Casey Family Programs Meeting on Optimizing Child Welfare System and CFSR Performance, 2/8/2011.
- Andrew Barclay, Isabel Blanco, Christopher Church, *The Child and Family Services Review: A Lens to Examine Georgia's Changing Child Welfare Environment*, [http://www.youtube.com/watch?v=q\\_jjYPxdawc](http://www.youtube.com/watch?v=q_jjYPxdawc), Georgia Child Welfare Legal Academy, Emory University School of Law, 10/8/2010.
- Andy Barclay, *National Perspective on Georgia's Child Welfare Outcomes*, National Governor's Association Georgia Mini-Institute, 6/23/2010.
- Donald Duquette, Andrew Barclay, *Protecting Children and Protecting Liberty: Improving Decision-Making in Removing Children in CPS Cases*, 17<sup>th</sup> National Conference on Child Abuse and Neglect, 4/2/2009.
- Andy Barclay, *Ground Truth: Using Data to Explore What's Really Happening at the Local Level*, Fulton County Justice for Children Summit, 9/19/2008.
- Andy Barclay, "Children Safe in Permanent Families" *A Dependency Court Bottom Line*, 31<sup>st</sup> National Juvenile and Family Law Conference, National Association of Counsel for Children, 8/4/2008.
- Andy Barclay, *Illinois NCANDS & AFCARS Child Welfare Measures for Courts*, UIUC Children and Family Research Center Retreat, 5/10/2007.
- Judge Nancy Salyers, Andrew Barclay, *Data: Telling a Story ... A Walk Through Meaningful Data Analysis*, Fostering Court Improvement, A Data Workshop for Decision Makers, 12/7/2006.
- Andy Barclay, *Engaging Court Stakeholders in Using Child Welfare Outcome Measures*, Casey Family Programs, Putting Data to Work, 10/17/2006.
- Andy Barclay, *Using AFCARS Data in Courts*, National Resource Center on Child Welfare Data and Technology Conference, 7/22/2005.
- ... and over 130 presentations to local juvenile court stakeholders.

#### Biostatistics:

- Waller, L.A., and Barclay, A.B. (2003). "Agile" GIS: Building application-specific spatial analytic software from freely available software tools. *Chance*, 16, 39-44.

Medical Imaging:

- EVR Di Bella, GT Gullberg, AB Barclay, RL Eisner, "Circumferential Profiles for Region-based Analysis of Dynamic SPECT Data", IEEE Medical Img. Conf. Proceedings, 1997.
- EVR Di Bella, GT Gullberg, AB Barclay, RL Eisner, " Automated region selection for analysis of dynamic cardiac SPECT data", IEEE Trans. Nucl. Sci., vol. 44, no. 3, pp. 1355-1361, June 1997.
- EVR Di Bella, AB Barclay, RL Eisner, RW Schafer, "Comparison of rotation based projectors for iterative reconstruction algorithms," IEEE Trans. Nucl. Sci., vol. 43, no. 6, pp. 3370-3376, December 1996.
- EVR Di Bella, RL Eisner, AB Barclay, RE Patterson, DJ Nowak, "Attenuation artifacts in SPECT: Effect of "wrap around" lung in 180 degree cardiac studies," J. Nucl. Med., vol. 37, pp. 1891-1896, November 1996.
- EVR Di Bella, GT Gullberg, AB Barclay, RL Eisner, "Automated Region Selection for Analysis of Dynamic Cardiac SPECT Data," IEEE Medical Imaging Conference, October, 1996.
- EVR Di Bella, RL Eisner, LS Schmarkey, AB Barclay, RE Patterson, DJ Nowak, DS Lalush, BMW Tsui, "Heterogeneity of SPECT bull's eyes in normal dogs: Comparison of attenuation compensation algorithms," IEEE Trans. Nucl. Sci., vol. 42, no. 4, pp. 1290-1296, August 1995.
- AB Barclay, RL Eisner, EVR Di Bella, "Construction of a thorax model database from clinical PET attenuation scans," SNM 42nd Annual Meeting, June 1995.
- TH Chu, AB Barclay, RE Patterson, RL Eisner, "Software validation and quality assurance for a new program to evaluate SPECT myocardial perfusion images," SNM 42nd Annual Meeting, June 1995.
- EVR Di Bella, RL Eisner, AB Barclay, RE Patterson, "Attenuation artifacts in SPECT: Effect of "wrap around" lung in 180 degree cardiac studies," SNM 42nd Annual Meeting, June 1995.
- KB Churchwell, WC Pilcher, RL Eisner, AB Barclay, RE Patterson, "Quantitative analysis of positron emission tomography: the "women's test" for coronary artery disease," SNM 42nd Annual Meeting, June 1995.
- EVR Di Bella, RL Eisner, AB Barclay, RE Patterson, "An evaluation of the iterative chang algorithm in large females," SNM 42nd Annual Meeting, June 1995.
- KB Churchwell, WC Pilcher, RL Eisner, TH Chu, AB Barclay, J Streeter, S Schmarkey, C Eaves, P Morrison, RE Patterson, "Accuracy of PET rubidium myocardial perfusion imaging to diagnose coronary disease: new software for objective quantitative analysis," SNM 41st Annual Meeting, June 1994.
- AB Barclay, TH Chu, RE Patterson, RL Eisner, "A nuclear medicine network for remote viewing and distributed processing," SNM 40th Annual Meeting, June 1993.